



uration of the human mind recapitulates its evolution, so the first parts of the brain to evolve—the motor cortex and brain stem—are also the first parts to mature in children. Those areas are fully functional by the time humans hit puberty. In contrast, brain areas that are relatively recent biological inventions—such as the frontal lobes—don't finish growing until the teenage years are over. The prefrontal cortex is the last brain area to fully mature.

This developmental process holds the key to understanding the behavior of adolescents, who are much more likely than adults to engage in risky, impulsive behavior. More than 50 percent of U.S. high school students have experimented with illicit drugs. Half of all reported cases of sexually transmitted diseases occur in teenagers. Car accidents are the leading cause of death for those under the age of twenty-one. These bleak statistics are symptoms of minds that can't restrain themselves. While the emotional brains of teens are operating at full throttle (those raging hormones don't help), the mental muscles that check these emotions are still being built. A recent study by neuroscientists at Cornell, for example, demonstrated that the nucleus accumbens, a brain area associated with the processing of rewards—things like sex, drugs, and rock 'n' roll—was significantly more active and mature in the adolescent brain than the prefrontal cortex was, that part of the brain that helps resist such temptations. Teens make bad decisions because they are literally less rational.*

*But there are ways to compensate for the irrational brains of teens. For instance, when West Virginia revoked driving permits for students who were under the age of eighteen and who dropped out of school, the dropout rate fell by one-third in the first year. While teens were blind to the long-term benefits of getting a high school diploma, they could appreciate the short-term punishment of losing a license. The New York City schools have recently begun experimenting with a program that pays students for improving their standardized test scores; initial results have been extremely encouraging. By focusing on immediate rewards, these incentive programs help correct for the immature prefrontal cortices of children and teenagers.